

**Notice of Allowability**

Application No.

09/900,777

Examiner

Kibrom K. Gebresilassie

Applicant(s)

BRAND ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to After-Final Response filed 10/4/2006.
2. ☒ The allowed claim(s) is/are 1-9, 11-19, 21 and 22.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some\* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date 10/25/2006
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_



KAMINI SHAH  
SUPERVISORY PATENT EXAMINER

### DETAILED ACTION

1. This communication is responsive to After-Final Response filed on October 04, 2006.
2. Claims 10, and 20 are canceled.
3. Claims 1-9, 11-19, 21 and 22 are pending.

### *Response to Arguments*

4. Regarding Applicants response to 112(1) rejection: Applicants argument regarding 112(1) rejection is persuasive. Accordingly, the rejection is withdrawn.
5. Regarding Applicants response to 101 rejection: Applicants argument regarding 101 rejection is persuasive. Accordingly, the rejection is withdrawn.
6. Regarding applicants response to 102 rejection: Applicant's arguments, see "REMARKS" page 7, lines 16-30, filed October 04, 2006, with respect to Claims 1, 21, and 22 have been fully considered and are persuasive. The rejection of 102(a) has been withdrawn.

### EXAMINER'S AMENDMENT

7. The application has been amended as follows:

#### Cross Reference to Related Application

The present application is related to U.S. Patent Application Serial No. 09/557,672 entitled "Method for Estimating Changes in Product Life for a Redesigned Product", filed on April 25, 2000, Now pending, and U.S. Patent Application Serial No. 09/900,779 entitled "Method for Estimating Changes in Product Life Resulting From HALT Using Exponential Acceleration Model", filed concurrently with the instant patent

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application, Now issued as US Patent No. 7,120, 566, and the disclosures of each are incorporated herein by reference.

8. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

9. Authorization for this examiner's amendment was given in a telephone interview with William E. Curry on October 18, 2006.

1. (Currently Amended) A machine-readable medium storing computer-executable instructions to perform a method of estimating a life of a product, the method comprising:

determining accelerated stress testing data for the product using ~~the~~ a relationship  $t_F = AF \times t_A^2$ , where  $t_F$  = a failure time on a field use time scale,  $AF$  = an acceleration factor, and  $t_A$  = failure time on an accelerated time scale, the accelerated stress testing data representing ~~the~~ a response of the product operating in a first environment; and

calculating ~~the~~ a mean-time-between-failures (MTBF) for the product operating in a second environment based on the accelerated stress testing data.

3. (Currently Amended) The machine-readable medium of claim 1, wherein the accelerated stress testing data represents ~~the~~ a length of time the product operates in the first environment before the product fails.

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8. (Currently Amended) The machine-readable medium of claim 1, wherein said step of calculating is performed during ~~the~~ a design of the product.

14. (Currently Amended) The machine-readable medium of claim 11, wherein said step of calculating includes using ~~the~~ a relationship  $\text{EXP} \left[ \frac{1}{k} \sum_{i=1}^k \ln \left( \frac{t_2^2}{t_1^2} \right) \right]$ ; and wherein  $t_1$  = time to first failure during accelerated stress testing for pervious design of the product, and  $t_2$  = time to first failure during accelerated stress testing for the product.

21. (Currently Amended) A machine-readable medium storing computer-executable instructions to perform a method of estimating a life of a product, the method comprising:

determining accelerated stress testing data for the product using ~~the~~ a relationship  $t_F = AF \times t_A^2$ , where  $t_F$  = a failure time on a field use time scale,  $AF$  = an acceleration factor, and  $t_A$  = failure time on an accelerated time scale, the accelerated stress testing representing ~~the~~ a response of the product operating in a first environment; and

calculating ~~the~~ a mean-time-between-failures (MTBF) for the product operating in a second environment based on the accelerated stress testing data,

wherein said first environment is more likely than the second environment to cause the product to fail; and

wherein the accelerated stress testing data is derived from a plurality of different stress tests.

22. (Currently Amended) A machine-readable medium storing computer-executable instructions to perform a method of estimating a life of a product, the method comprising:

determining accelerated stress testing data for the product using ~~the~~ a relationship  $t_F = AF \times t_A^2$ , where  $t_F$  = a failure time on a field use time scale,  $AF$  = an acceleration factor, and  $t_A$  = failure time on an accelerated time scale, the accelerated stress testing data representing ~~the~~ a response of the product operating in a first environment; and

calculating ~~the~~ a mean-time-between-failures (MTBF) for the product operating in a second environment based on the accelerated stress testing data,

wherein said first environment is more likely than the second environment to cause the product to fail; and

wherein said accelerated stress testing data is determined at least in part from bill of materials (BOM) information on the product.

***Allowable Subject Matter***

10. Claims 1-9, 11-19, 21 and 22 are allowed.
11. The following is an examiner's statement of reasons for allowance:
12. The prior art referred to the reasons of allowance is as follows:
  - a. "ADI Reliability Handbook," by Analog Devices Inc., 2000, herein referred as ADI.

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13. ADI reference teaches the use of "Arrhenius equation" for product failure analysis (See. page 11 of ADI):

$$(i) \quad At = t_1/t_2 = \exp.[-E_a/k (1/T_{TEST} - 1/T_{USE})]$$

ADI teaches "Acceleration Factor" for accelerating stress testing using the Arrhenius equation shown above. Further, ADI teaches a "bathtub curve" which shows early life fail at the beginning, useful life at the middle, and wearout of product at the end (See Fig. 3 on page 8 of ADI). This action is also inherent to Arrhenius.

14. However, ADI references does not expressly teach or disclose "determining accelerated stress testing data for the product using the a relationship  $t_F = AF \times t_A^2$ , where  $t_F$  =a failure time on a field use time scale,  $AF$  =an acceleration factor, and  $t_A$  = failure time on an accelerated time scale, the accelerated stress testing data representing the a response of the product operating in a first environment."

15. Dependent Claims 2-9, and 11-19 are allowable because they depend from allowable Independent Claim 1.

16. Claims 21, and 22 are allowable for the same reasons as Claim 1.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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**Conclusion**

17. Any inquiring concerning this communication or earlier communication from the examiner should be directed to Kibrom K. Gebresilassie whose telephone number is (571) 272-8571. The examiner can normally be reached on Monday-Friday, 8:30 am to 4:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner supervisor, Kamini S. Shah can be reached at (571) 272-2279. The official fax number is (571) 273-8300. Any inquiring of a general nature relating to the status of this application should be directed to the group receptionist whose telephone number is (571) 272-3700.

**Kibrom K. Gebresilassie**  
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